

CONFERENCE ON GLOMERULONEPHRITIS*

Panel Discussion, Afternoon Session

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NORMAN BANK, MILTON E. RUBINI, GEORGE E. SCHREINER

DR. JEROME LOWENSTEIN. Dr. Bank, did you want to say something about the possible role of physical factors in the sodium retention and diuresis seen in acute glomerulonephritis?

DR. NORMAN BANK. Yes. There was not enough time during my discussion to relate the newer findings on peritubular control of sodium reabsorption to clinical conditions, but these recent observations may have several clinical implications. For example, as I indicated, the protein concentration in peritubular capillary blood seems to have a great deal to do with the rate of absorption of sodium. In conditions such as congestive heart failure, filtration fraction is usually quite high. That is, renal blood flow is reduced to a greater extent than is glomerular-filtration rate. This means that the concentration of proteins is probably higher in the peritubular capillaries than in normal individuals. It seems possible that the mechanism for retention of sodium in congestive heart failure may be related to the higher concentration of protein in peritubular capillary blood, which would be expected to enhance reabsorption.

In cirrhosis of the liver there is often a reduced renal blood flow. Patients thus afflicted might similarly have elevated protein concentrations or diminished hydrostatic pressure in their peritubular capillaries, which might then tend to enhance the reabsorption of sodium and lead to the formation of edema.

As far as intrinsic renal disease is concerned, one can speculate about the situation in chronic renal disease more readily than in acute renal disease. When there is a reduced number of functioning nephrons in

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chronic renal disease, the blood supply to these remaining nephrons is in all probability increased above normal levels. It has been shown that the filtration rate is greatly increased in the remaining nephrons of experimental animals with renal disease. Because of the higher blood supply to these surviving nephrons, the peritubular capillary hydrostatic pressure may be somewhat higher than in normal individuals. A higher peritubular pressure might contribute to the progressive decrease in tubular reabsorption per nephron that occurs in patients with advanced states of renal disease; the decrease allows them to remain in sodium balance despite a greatly reduced over-all glomerular filtration rate.

In acute nephritis the problem is more difficult to explain on the basis of peritubular physical forces for several reasons. One reason is that the data from most studies show that filtration fraction is lower than normal in acute nephritis. That is, glomerular filtration rate is reduced more than is renal blood flow. This would be expected to lower the concentration of proteins in the peritubular capillary blood, which according to the theory would inhibit sodium reabsorption. There might be, however, a reduction in hydrostatic pressure in the peritubular capillaries which could conceivably play a role in leading to the retention of sodium in acute nephritis. Another possibility is that there may be a redistribution of blood flow within the kidney in these patients. If the cortical nephrons get a greatly diminished blood flow, and most of the renal blood flow is going through deeper medullary nephrons, sodium retention might result because the deeper nephrons may normally reabsorb more sodium than the cortical nephrons. Perhaps this might play some role in the formation of edema.

DR. LOWENSTEIN. Dr. Rubini, alleviation of uremic symptoms by restriction of protein does not prove that some metabolite of protein is the toxin or the source of toxins in the uremic syndrome. Have you been able to produce uremic symptoms in patients with reduced renal function who have not otherwise had uremic symptoms by overloading with protein, by forced feedings, or by feeding proteins of a lower biologic value?

DR. MILTON E. RUBINI. I think that this fits into most of our clinical experience. For example, consider the patient who first gets sick after a Christmas or Thanksgiving dinner, i.e., a massive dietary overload. We have not tried to duplicate this situation experimentally.

DR. SCHREINER. Several years ago a private surgeon in Washington was fond of administering protein hydrolysate postoperatively to all patients. Every once in a while he would administer it to someone with chronic renal disease. We were then receiving patients with really fulminating uremia from one hospital in particular. Patients would be referred to us with frost and neurological symptoms developing rapidly; they would improve by simply waiting for the elimination of the protein hydrolysate. I think it is possible to produce uremia in patients with renal disease by overloading with protein or protein hydrolysate.

Dr. Rubini asked me to mention the uniform donor card for persons willing to donate organs. The project for this card, which has been a long time aborning, developed as follows.

Many years ago several of the health foundations talked about a uniform donor card. The problem was that we did not have uniform laws, so that we had to start at a grass-roots level. As you know, there has been a Committee on Uniform Legislation of the American Bar Association that has worked with the Committee of the American Medical Association, with many health foundations, and with the Ad Hoc Committee of the National Institutes of Health (NIH). Finally a Uniform Donor Act has been introduced in most state legislatures. It has been the most rapidly moving piece of legislation in the history of the United States. As of now it has been passed by 43* state legislatures, and another five states have testamentary disposition by simple codicils without recording, so that the technique of a card is now legal in 45 states.

The seemingly insurmountable problem was to get several hundred people to agree on the wording for such a card, which was no mean task. We finally succeeded. Wording has now been formulated that suits all the foundations; it has also been approved by the usual group of Harvard law professors, plus the general council for the General Services Administration and the NIH.

One and a half million of these cards will be in the hands of practicing physicians. They were reproduced in the March 9 issue of *Modern Medicine*. They will be available through many of the foundations, including the Kidney Foundation, the eye banks, and so forth. All three groups will have these cards. Here is the wording.

"This uniform donor card of (name). It is to take effect

*Forty-eight jurisdictions as of July 1970.

on my death. The remarks below indicate. . . .” and then there are three choices with regard to various organs or in entirety. It mentions limitation or special wishes, if any, and then, on the back, it is signed by the donor and two witnesses. There is the donor’s signature and date of birth, which is included because some states require that the donor be at least 18 years old; others, 21. Then there are the signatures of the donor and of two witnesses, and a statement that this is a legal document under the Uniform Anatomic Gift Act or similar legislation.

As I said, this card is now valid in 48 states. A bill validating it for the District of Columbia has passed the Senate and is expected to pass the House. Everyone will be seeing it in many different forms over the next year. I urge you to study it in order to be able to answer the questions that patients will ask in requesting it.

If this card is found in the wallet of any person who is dying or dead in any state that has passed the legislation, no other registry and no other legal instrument is necessary.

DR. RUBINI. Let me add as an afterthought that there was a meeting in Los Angeles in December that brought together transplant units from all parts of the country and from Canada.

Several developments are especially interesting. First, the typing system is now countrywide and, with standard antiserum from NIH, we are starting to get the same match classifications from various parts of the country.

Second, methods for preserving organs are improving to the point that in many cases we are now transplanting 6, 8, and 12 hours after death of the donor. We now can go to three days in dogs.

This means that kidneys being “harvested”—and I use the word advisedly—in Los Angeles can be used all over the western states. Even New York is no farther away from the West than a five-hour airplane ride, well within the concept of putting all our patients in a single pool of recipients and, within the next year or so, delivering the best match kidney to wherever that patient may be. There are all sorts of interesting stories about delivering kidneys to patients many hundreds of miles from the site of harvest. This is becoming more and more practical.

We still must make every effort to increase the availability of donor kidneys. We shall then find fertile ground for their utilization by teams that can put them to much better use than was possible two years ago.

DR. LOWENSTEIN. I might say that we are doing that in the New York

area, and that we have quite a large pool that uses machines for preservation. We have flown kidneys from New Jersey by helicopter and they have been put on the machine in New York Hospital. Once when they did not match those of our patients, we sent two to The Mount Sinai Hospital and four to Montefiore Hospital. Many hospitals are showing interest in this development. The next step is to hook up with the West Coast.

DR. SCHREINER. We have a 12-hospital and university network consisting of Johns Hopkins, Maryland, Georgetown, the University of Virginia, the Medical College of Virginia, Duke, Chapel Hill, North Carolina, Bowman Gray, and Emory. We have a single computer that does the matching for the whole dialysis pool. We have done three transplants since the first of the year. One was from Atlanta, one from Richmond, and one from Charlottesville. In the case of the kidneys that came from Atlanta: the donor died at 5:45; his kidneys were on a commercial Delta Airline flight at 6:30; in Washington, D.C., at 7:30; and making urine there at 9:00 o'clock. The big delay in New York City is in getting to La Guardia airport and back by surface transportation.

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